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Rhodora

JOURNAL OF

THE NEW ENGLAND BOTANICAL CLUB

Vol. 21. December, 1919. No. 252.

NOTES ON THE AMERICAN OCCURRENCE OF CREPIS BIENNIS.

Bayard Long.

The large genus *Crepis* is represented in the eastern United States by certain species of the Old World. These are weedy plants with somewhat the aspect of Hieraciums and are found introduced on roadsides, in fields, and about waste places. Of various species of the genus collected in this country from time to time all but a few have proved to be merely waifs. There has been a concensus of opinion, however, that four species have become sufficiently well established here to be recognized as elements of our flora. With the exception of *Crepis pulchra*, known only very locally from Virginia, there are commonly accredited to our region: *Crepis tectorum*, well characterized by involute cauline leaves; *C. capillaris* (*C. virens* of the older manuals) and *C. biennis*, both with plane stem-leaves, the former with small heads of flowers and 10-ribbed achenes, the latter with rather large heads and 13-ribbed achenes.

In the Philadelphia area these plants are to be considered as rather rare introductions, or at least only locally frequent. The greater part of our material is from ballast ground, collected many years ago, but recently scattered specimens have been coming in to the Herbarium of the Philadelphia Botanical Club from roadsides and cultivated ground — frequently grass-lands or newly-seeded lawns. In the absence of any personal experience in the field with the genus these specimens had never aroused sufficient interest to cause them to be more than very casually examined. In the early autumn of 1915 at

Toms River, New Jersey, an acquaintance with a conspicuous roadside weed belonging to this genus supplied the requisite interest to make a more careful study of these plants.

In critically examining at the Academy of Natural Sciences the American material of these introduced species of *Crepis*, a point of some interest was brought to light. It was seen that of the three species credited to our area the greater number of specimens by far represented *C. capillacea;* a lesser number, *C. tectorum;* but none, *C. biennis!* It was somewhat disconcerting to have found no *C. biennis.* The material from this country bearing the name "Crepis biennis" had indubitably fallen into *C. tectorum.* From descriptions and from European material in the Academy Herbarium *C. biennis* had been found to be a robust, more or less rough-hairy plant with large heads of flowers (involucre about 1 cm. tall, with its bracts pubescent on the inner faces), and achenes about 4–5 mm. long, olivaceous, 13-ribbed, not beaked — a well marked plant, very different superficially, as well as in its more obscure and technical characters, from the other Old World species accredited to America.

A unanimity of opinion was seen in our American manuals in crediting the plant with a more or less extended range: in *Gray's New Manual,* "N. E. to Pa. and Mich." and in the new edition of the *Illustrated Flora,* "Vermont to Pennsylvania, Michigan, and in ballast about the seaports." An interest naturally centered in the Pennsylvania occurrence.

In Taylor's *Flora of the Vicinity of New York* it was found with some surprise to be "more common in Pa. than elsewhere."[1] Reference to Keller and Brown's *Flora of Philadelphia and Vicinity* showed their knowledge of the plant to be based entirely upon two records in Porter's *Flora of Pennsylvania* — one for Easton, in Northampton County and another for Chester County.[2] On being verified in Porter's *Flora* these were found to constitute the entirety of his records for the state.[3]

The Porter Herbarium had then only recently arrived at the Academy, and although in rather a disorganized condition for locating a small series like *Crepis,* the fact of two definite records in his *Flora* was incentive enough to search diligently for the basis of these records.

[1] Taylor, Fl. Vic. N. Y. 645 (1915).
[2] Keller & Brown, Fl. Phila. & Vic. 311 (1905).
[3] Porter, Fl. Pa. 305 (1903).

With the passing of Professor Porter's guardianship, his herbarium, with its loose plants and labels, in many groups had suffered much from careless handling, but fortunately the thin covers of *Crepis* in the Pennsylvania series had been quite undisturbed. In the cover labelled "Crepis biennis L." were two plants: one ticketed in pencil "Coll. Grounds, '69," presumably those of Lafayette College and thus the basis of the Easton record for Northampton County; the other from Wm. M. Canby with the data, "Introduced, Chester Co., Pa. 1863." The "Coll. Grounds" specimen though named "Crepis biennis" in Porter's hand (the rest of the label, however, doubtfully his) is a plant quite different from that species. It is low, scapose, with a single, rather large head, superficially somewhat resembling a dandelion and apparently referable to *Leontodon hispidus*. The Canby specimen had been named originally "Apargia autumnalis L." but Porter, in the process of doubtless numerous examinations of this strange plant, had crossed through Canby's identification, transferred it to *Leontodon*, affixed a large "?", affirmed a "No!", written "Crepis" in ink and penciled "biennis?" and then finally inked in "biennis L." The specimen shows a branch of evidently a robust plant, rough-pubescent, and with plane stem-leaves. Unfortunately it is only in bud and insects had wrought havoc with the immature achenes, but from the large size of the buds and the pubescent character of the inner faces of the involucral bracts it seems clear that this is indeed authentic *Crepis biennis*.

Further search in Philadelphia, at the College of Pharmacy and the University of Pennsylvania, produced no other material — except a fine specimen of *Sonchus arvensis* masking under the name of "Crepis biennis."

It had become quite evident by this time that *Crepis biennis* was far from being a plant familiar to Philadelphia botanists. Taylor's assertion of its greater frequence in Pennsylvania than elsewhere thus naturally led to an inquiry concerning the basis of this statement. Mr. Taylor kindly wrote me that his data consisted of apparently only the Porter records. With a deficiency of material at the New York Botanical Garden and two definite records from Pennsylvania his statement was readily verified — but not very happily phrased, it was felt, for information on the supposed occurrence of the species.

With the Pennsylvania records for the range of the species apparently satisfactorily reviewed, a brief search indicated that the New

England occurrence was probably based upon the notation of "Vermont, *Pringle*," in the *Synoptical Flora*[1] (amplified in the recent *Flora of Vermont* to the definite station, Charlotte)[2] and "Mass." in Watson and Coulter's Edition of Gray's *Manual*.[3] Michigan appeared to originate in the new Gray's *Manual*. The specimen bases of these records all probably being still extant at the Gray Herbarium, Professor Fernald's interest was evoked, but pleading an unfamiliarity with the group, on being pressed for critical opinions on the identities of these plants, he enabled me to borrow the material — and to draw my own conclusions.

The bases of the records for Vermont, Massachusetts, and Michigan happily were all found preserved in the Gray Herbarium. The first is labelled: "Hieracium? Charlotte, Vt. (a casual) June 7th, 1875. C. G. Pringle," and the sheet marked twice with Gray's identification, "*Crepis biennis*," and a small "Syn. Fl. N. Amer." ticket attached. There are three good, essentially complete, specimens crowded upon the sheet. It is at once evident that this is not a homogeneous series representing a single species. One of the plants, with rather few, notably large heads, is recognizable as characteristic *C. biennis*. The remaining two, although superficially somewhat similar to *C. biennis*, show inflorescences of more numerous, appreciably smaller heads, and, except for the rough pubescence on stems and leaves, might readily be taken offhand for *C. capillacea*. On more critical examination they are found to have the inner faces of the involucral bracts glabrous, the achenes 10-ribbed, and about 3–3.5 mm. long — which conclusively shows that these plants cannot be *C. biennis*. One of them has pinnatifid leaves, similar to those of *C. biennis*, but the other has entire or remotely toothed leaves. There is also a decided difference in pubescence, especially on the inflorescence. They are both apparently referable, however, to *C. Nicaeensis* Balb.— the plant with the uncut foliage probably representing the form called *β. integrifolia* Lamt. in Rouy's treatment.[4] The Massachusetts record is based upon two specimens with the label, in the hand of Sereno Watson, reading: "Crepis biennis, L. Wianno, Mass., sandy soil, near a dwelling. Miss L. M. Hill — June 1887." These appear to have the

[1] Gray, Syn. Fl. i. pt. ii. 430 (1884).
[2] Flora of Vermont. Vt. Agr. Exp. Sta. Bull. 187. 253 (1915).
[3] Gray, Man. ed. 6. 300 (1890).
[4] Rouy, Fl. Fr. ix. 227 (1905).

technical characters of *C. Nicaeensis*. They certainly do not represent *C. biennis*. The Michigan basis rests upon a sheet of two specimens, labelled: "Herbarium, Agricultural College, Mich. Crepis biennis L. In meadow on the College farm seeded with orchard grass seed imported from France. Coll. C. F. Wheeler, 15–VI–97." These again apparently represent *C. Nicaeensis*.[1]

The material from the Missouri Botanical Garden, loaned me through the kindness of Dr. Greenman, showed no specimens of the desired species; but that from the National Herbarium, generously sent me by Mr. Standley for examination, produced a specimen from a new locality. This is labelled as collected at Asheville, North Carolina in 1888 by Gerald McCarthy. The specimen is a nearly complete plant in full flower showing the characteristic large heads of the species. As an indication of the size and general appearance of the expanded heads it is interesting to note that the original label reads: "Cynthia virginica" — which, however, has been crossed out and "Crepis biennis" written above in pencil.

In the general search for records of a definite occurrence of *Crepis biennis* it was noted that in Piper and Beattie's *Flora of the Northwest Coast* this species is reported from Vancouver Island on authority of Macoun.[2] A specimen collected by John Macoun and so named has been seen from Vancouver Island in the United States National Herbarium. Similar material, collected at a later date and then named *Crepis virens* by Macoun, is contained in the Herbarium of the Missouri Botanical Garden. Superficially, in habit, leaf-shape and generally hispid character, these plants suggest in some measure a reduced *Crepis biennis*, but the technical characters of glabrous inner faces of the involucral bracts and generally 10-ribbed achenes, coupled with the smaller size of the heads and of the achenes, show that they represent further American material of what appears to be *C. Nicaeensis*.

It is quite possible of course that continued search in the herbariums of the country might reveal a few more specimens of authentic *C. biennis*, but when the large collections already examined were able to

[1] It is pertinent to note that Rouy in the *Flore de France* indicates that the species is introduced with lucernes throughout Central Europe, Great Britain, Denmark and southern Sweden. One cannot but speculate whether *C. Nicaeensis* has not arrived in this country in a similar way and is to be classed with the various other European species that, as waifs, are picked up usually in clover-, alfalfa-, or grain-fields, or grass-lands.

[2] Piper & Beattie, Fl. Nw. Coast. 359 (1915).

show only three meager specimens, it seems very unlikely that sufficient material could be found to warrant the belief that this is a species worthy of an unchallenged place in all our manuals. It must not be forgotten, moreover, that these three specimens all represent distinctly ancient collections and that detailed information on their occurrence at these stations is quite lacking, except in the case of Pringle's collection. From his reference to the species at Charlotte as a casual and the fact of his collection consisting of three different forms, it is no great stretch of the imagination to visualize a weedy field planted with imported seed and containing scattered plants of *Crepis* and doubtless various other foreign species. It surely would have been difficult, except in some such habitat, to pick up three such unusual forms in one collection. Every collector knows the value to be attached to the occurrence of introductions of this type. It is equally well known how frequently an unusual introduction occurs as a single plant or a small colony and how familiar the circumstance is of its failure to reappear the following year. At times, of course, the collector is himself the cause of this but more often it is only the regular course of a strange plant failing to establish itself. Whether this species actually occurs at any of these localities at the present day is a matter open to very considerable doubt. In all probability it is not of a vigorous and weedy character and has long since died out at all three stations.

It seems scarcely necessary to suggest that the conclusion to be drawn from these notes is that much new evidence is needed on the presence of *Crepis biennis* on this continent to maintain it satisfactorily as an element of our flora. Until conclusive information is obtained of its actual establishment with us, it seems only just that it should be classed with the various other species of the genus (and is *C. tectorum* above suspicion?) that appear from time to time, chiefly in cultivated fields, and disappear within a year or two. There is no question of the interest attaching to strange and curious weeds that are found on lawns or among alfalfa, grain or other crops, but it is urgently desirable that these waifs be not confused with introductions that really have become naturalized.

Academy of Natural Sciences of Philadelphia.

THE NEW GENUS BROMELICA (THURB.) FARWELL.

James C. Nelson.

The arguments adduced by Mr. Farwell in support of his proposed new genus *Bromelica* (Rhodora **21**: 76–78) are very convincing as long as the delimitation of *Melica* is based on the characters taken by most American authors as distinctive. Certainly if the genus is established primarily on the texture of the lemmas and the arrangement of the uppermost into a club-shaped mass, it becomes very difficult to construct any key that will place the species *striata, Smithii, aristata, subulata, Harfordii* and *Geyeri* under the genus. Yet, as Mr. Farwell points out, this is just what American botanists have done, with results that have led to much inconsistency and confusion. If these are indeed the characters that distinguish *Melica* from its allies, a subdivision of the genus seems inevitable.

But the question arises whether the characters above stated are correctly taken as those on which the genus is established. Undoubtedly it is excluded from Aveneae for the reasons advanced by Mr. Farwell, i. e., the glumes are *shorter* than the lower floret, and the rachilla is not prolonged. Clearly then it belongs in Festuceae, as long as that tribe is delimited as at present. Just as clearly it is separated from *Festuca* by the bifid apex of the lemma. Apparently then *Bromus* is its nearest ally among the North American grasses. But cannot some less minute character than the pubescence of the grain or its adherence to the palet be found to distinguish *Melica* from *Bromus*, which will at the same time permit the retention of the species of Mr. Farwell's *Bromelica* under the original *Melica?*

After a careful study of Hackel's key to the Festuceae (in Engler & Prantl, Nat. Pflanzenfam. ii. Abt. 2, 61–64), I cannot feel that he regarded the texture or arrangement of the lemmas as determining characters, or that he would have accepted the prevailing American delimitation of the genus. The essential facts seem to him to be (1) the *presence* of imperfect florets on the upper part of the spikelet; (2) the *number* of such florets — not their texture or arrangement. The genera in which these sterile or empty lemmas are uniformly *two or more* might then be set off from those in which normally only *one*,

and that the uppermost, lemma is sterile or empty — in which group both *Festuca* and *Bromus* would be found. Those in which two or more imperfect florets exist might be further subdivided into

(a) Lemmas 1–3-nerved, including *Eragrostis, Sphenopholis, Koeleria,* and *Catabrosa.*

(b) Lemmas 3–5-many-nerved, including *Diarrhena* and *Melica,* as well as the South American *Anthochloa,* the African *Harpachne,* and the Australian *Ectrosia* and *Heterachne.*

It must not be overlooked that occasionally specimens of *Festuca* or *Bromus* are found with more than one empty lemma; but these are the exception rather than the rule. Tribal and generic differences must be based on *prevailing* rather than *universal* characters, and there can be no doubt that the *single* empty lemma predominates in *Festuca* and *Bromus,* just as in *Melica* and its allies the existence of more than one imperfect floret is fairly constant.

If these characters be taken as the basis of our dichotomy, the subgenus *Bromelica* may still remain in *Melica,* because it agrees in having uniformly more than one imperfect floret; and the membranous texture and more remote arrangement of the upper lemmas become characters of subgeneric rank. The nearest ally of *Melica* among American grasses would then not be *Bromus* or *Festuca,* but *Diarrhena,* from which it would be easily distinguished by its three stamens (*Diarrhena* having 2 or rarely 1) and 1 lodicule (*Diarrhena* having 2).

Melica would further be distinguished from the other genera with more than one imperfect floret as follows: *Heterachne* and *Harpachne* have lemmas and glumes *keeled, Anthochloa* has the lemmas *fan-shaped, Lophatherum* and *Ectrosia* have the sterile lemmas *awned.*

But the attempt to distinguish *Melica* on texture and arrangement of the upper lemmas alone will, as Mr. Farwell has pointed out, never be satisfactory. I am inclined to think, however, that the problem is not to be solved by a segregation of the genus, but by an attempt to find a different set of characters on which to base the delimitation; and this cannot be done until we consider the genus in wider relations than those afforded by its North American allies.

Salem, Oregon.

TWO COLOR FORMS OF LOBELIA CARDINALIS L.

Harold St. John.

An unusual rose-colored form of *Lobelia cardinalis* L. was recently sent from Jaffrey, New Hampshire, by my friend, Miss E. M. Parker. In the Gray Herbarium is a specimen of the same form from East Jaffrey, collected by E. L. Rand and B. L. Robinson in 1901. This rose-colored form, then, appears repeatedly, if not continuously in Jaffrey. In the first edition of his Manual, Dr. Gray says[1] of *Lobelia cardinalis* L., "rarely varying to rose-color! (Plymouth, *Mr. Gilbert*)," and in the Gray Herbarium is an old sheet of this form, with imperfect data, that is presumably Mr. Gilbert's plant from Plymouth, or specimens raised from seed obtained from Mr. Gilbert. In 1871 this plant was mentioned in the Torrey Bulletin,[2] "flesh colored variety, 1868, *Meriam*." Later, in 1912, Dr. Witmer Stone noted,[3] "Near Green Creek I have found a plant with pale salmon pink flowers." Striking color-forms such as this attract the attention of any observer, so they may well be designated by a name.

Lobelia cardinalis L., f. **rosea** n. f., floribus roseis. Flowers rose-colored. New Hampshire: flowers roseate, mountain stream, East Jaffrey, Aug. 31, 1901, *E. L. Rand & B. L. Robinson*, no. 1,007 (type in Gray Herb.); brookside near East Jaffrey, Aug. 29, 1919, *Miss E. M. Parker*.

Like most colored flowers, *Lobelia cardinalis* L. has an albino form. It is of occasional occurrence, and it has often been mentioned in the botanical journals and in the floras from the time of Muhlenberg[4] who indicates it by "*Corolla* alb. / cocc. } 5. cardinalis," and by Pursh,[5] "I have seen a white variety of it," down to the present time. This should be known as:

[1] Gray, Asa: Man. Bot. N. U. S., ed. 1. 253 (1848).
[2] Bull. Torr. Bot. Club ii. 12 (1871).
[3] Stone, Witmer: Pl. of S. N. J. 715 (1911).
[4] Muhlenberg, Henry: Cat. Pl. Am. Sept. 22 (1813).
[5] Pursh, Frederick: Fl. Am. Sept. ii. 448 (1814).

Lobelia cardinalis L., f. **alba** (A. Eaton), n. comb. *L. cardinalis* L., var. *alba* A. Eaton, Man. Bot. N. Am., ed. 7, 375 (1836). *L. cardinalis* L., β *alba* Wood, Class-Book of Bot. ii. 227 (1845). *L. cardinalis* L., γ *candida* Wood, Am. Botanist and Florist 195 (1870).

Gray Herbarium.

FURTHER NOTES ON PHILOTRIA.

R. W. Woodward.

In a recent issue (Rhodora **21**: 114), the writer reported what appeared to be *Philotria angustifolia* growing in brackish water at Old Lyme, Connecticut. The station was revisited in August, 1919, and both flowers and fruit were examined while fresh, so that they can be described in more detail than was possible from dry specimens. Experience proves these parts of Elodeas to be unsatisfactory in the dry state, even when great care is used in preparing them.

At this station the plant occurs as a narrow fringe at the extreme edge of low water, and cannot well be collected except for a short time at the turn of the tide. Hundreds of staminate flowers were seen floating on the slowly moving water as it began to return. Many of these were surrounded by pollen grains, moving along with them, while others that had not yet discharged their pollen, emitted a copious pollen shower at the slightest jar. In these expanded flowers, the three purplish, or purple-flecked, somewhat ventricose, obovate sepals, which are barely united at base, are so strongly reflexed that they meet beneath and resemble a thin, wide peduncle. The narrower petals are similarly reflexed. Consequently the whorls of nearly sessile anthers are raised in effect above the perianth, and the latter cannot impede the flight of the pollen when it is ejected. Possibly also the reflexed perianth, traveling in the water, steadies the rest of the flower and keeps it upright above the surface and in the best position to scatter its pollen. The anther cells are 0.8–1.1 mm. long and very plump, and the firm pollen grains are noticeably large. As the perianth, if spread out flat, could hardly exceed 3 mm. in breadth, it appears that the anthers are large for the size of the flower, and the amount of pollen correspondingly great. In fact, when floating on the water, the whorls of anthers are the conspicuous part of the flower.

In the pistillate flowers, the three obovate, ventricose, purplish calyx-lobes ascend between the three stigmas, while their tips are sharply incurved and form a cup-shaped depression at the base of the stigmas. The whitish, wider petals are recurved and nearly concealed beneath the broad recurved stigmas. As will be seen, the whole forms a minute depression, or bowl, at the surface of the water, and is well adapted to intercept floating grains of pollen and bring them into contact with the stigmatic surfaces. The calyx-lobes are smaller in the pistillate flowers, which are 2 mm. broad, when expanded. Staminodia were observed.

Since the delicate spathe is easily ruptured, the fruit readily escapes and is borne away or sinks into the mud, and is hard to find. In the brief interval at the turn of the tide, more than twenty five specimens of good fruit were secured. In the former note, the fruit was called globose. It should be described rather as blunt plano-convex. The plane side is distinctly flat and has a thin, rather wide, continuous wing. The ridge of the convex surface is truncate and this smaller plane is also winged. In outline lengthwise, the fruit varies from circular to oblong but is prevailingly oblong. It is 1.5–1.7 mm. long and about 1 mm. (exceptionally 1.5 mm.) broad.

In the twenty or more cases where it could be measured accurately, the tubular, two-toothed spathe was found to be 5–7 mm. long.

The writer has not had opportunity to compare the plant with authentic material of *Philotria angustifolia*, and cannot affirm that it is that species but it would seem to be the same, or at least close to it.

It is a pleasant picture to recall,— a quiet August morning, the incoming tide mirror-like in its smoothness and bearing on its flood flowers that are so seldom seen. Many of these, perhaps one hundred, were collected, but they were so elusive and the shore shelved so abruptly, that hardly one in ten could be secured of those that were floating past. It was a fortunate combination of circumstances, which might not occur again in a season, possibly, not in a lifetime.

New Haven, Connecticut.

Vol. 21, no. 251, including pages 193 to 208, was issued 8 December, 1919.

ERRATA.

Page 7, line 34, *for* Britton *read* Britten.
" 10, " 41, for HYDBOPHILA read HYDROPHILA.
" 75, " 11, for *Nejas* read *Najas*.
" 114, " 28, for *elodea* read *Elodea*.
" 116, " 1, for *Hierochloeodorata* read *Hierochloe odorata*.
" 125, " 14, for *lacinata* read *laciniata*.
" 145, " 30, for *Colcopleurum* read *Coelopleurum*.
" 170, " 15, for *Carophyllaceae* read *Caryophyllaceae*.
" 178, " 13, for **americana** (Fisch.), n. comb. read ~~AMERICANA (Fisch.)~~ Nieuwl.
" 182, " 21, for *Sphenoscadium* read *Sphenosciadium*.
" 208, " 12, dele the period after 1919.

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